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## RIVERS AND FLOODS

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5th, 12th, 19th, 20th, 24th, and 27th; for northern New Mexico on the 27th, 29th, and 30th; for southeastern Colorado on the 12th, 18th, 19th, 20th, and 21st; for the Colorado Valley in Colorado on the 14th, 18th, 19th, and 21st; for all of Colorado on the 27th and 30th; for southeastern Arizona on the 15th, 17th, 25th, and 26th; for south central Arizona on the 25th; and for northwestern Utah on the 17th, 18th, 19th, 21st, 24th, 25th, 26th and 27th. These warnings were generally justified by the actual occurrence of frost or by the critical temperatures for frost.

Warnings of more severe temperatures embracing those close to or below freezing were issued as follows: 1st and 3d, extreme southeastern New Mexico; 9th, southeastern Colorado, 15th, Colorado and Utah; 16th Colorado, Utah, and extreme southeastern New Mexico; 17th, Colorado and extreme southeastern New Mexico; 24th, Colorado; 25th and 26th, Colorado and northern and extreme eastern New Mexico; and the 29th for Colorado. In nearly every case these warnings were fully verified.—*Lawrence C. Fisher.*

## SAN FRANCISCO FORECAST DISTRICT

April in the San Francisco Forecast District was usually dry, due to the persistence of ocean high-pressure areas impinging upon the California and Oregon coasts. They prevailed, with slight variations, practically during the entire month. There were about as many Bering Sea and Gulf of Alaska storms as usual, but they moved inland too far north to cause any great amount of rain in the Pacific States. On the 20th a small disturbance was located off the California coast, which moved inland on the 23d, and in doing so caused a small amount of rain in the southern half of California. Rain also fell during the first few days of April quite generally throughout the district. Nearly all the storms that occurred passed from the ocean inland over northern British Columbia to Alberta and thence formed a trough of low pressure that extended south through Idaho and Nevada. The lower end of the trough when over southern Nevada received sufficient moisture from the ocean to cause some few showers in California and Nevada. The drought, however, in the former State is the worst that has been experienced since the establishment of the Weather Bureau, as up to the end of April only about 50 per cent of the normal rainfall has occurred in California. The droughty situation is worse in the northern portion of the State than in the southern, which is very unusual. The nearest approach to the present dry spell occurred during the season of 1897-98, when only 54 per cent of the normal amount of precipitation was received during that season and the southern part of the State suffered most, which is just the opposite to the present conditions.

Frost warnings were issued in the north Pacific States on 15 days and in northern California on two days. No damage was done by frosts in California; but they were unusually severe in portions of the north Pacific States, where crops were badly injured.

Storm warnings were displayed at the entrances to the Gulf of Georgia and the Strait of Fuca and at the mouth of the Columbia River on the 17th. Small-craft warnings were ordered at a few places on the 15th, 18th, and 23d.

Livestock warnings were issued on April 3 for eastern Oregon, Nevada, and southern Idaho; and fire-weather warnings were issued on the evening of the 24th for northern California. All of these warnings were justified except the fire-weather warning was not followed by as high temperature as expected.—*E. A. Beals.*

At the close of March, 1924, the Ohio River was in flood as far down as the mouth of the Great Kanawha River. The crest stage at Point Pleasant, W. Va., on the Ohio River was 44.5 feet on April 2. Below Point Pleasant, flood stages were not recorded until Cloverport, Ky., was reached. From this place to Shawneetown, Ill., just below the mouth of the Wabash River, the crest stages varied from 0.7 foot to 4.1 feet above the flood stages, the greatest excess at Shawneetown. Below Shawneetown the river was 5 or more feet below the flood stage, and the crest passed into the Mississippi River on April 11, with a stage of 40.7 feet at Cairo, Ill., reaching the Gulf of Mexico about April 25.

The flood was very accurately forecast and there was no damage of consequence, although some inconvenience and delay in farm work resulted. In the vicinity of Shawneetown, Ill., property to the amount of \$10,000 was saved through the warnings.

There were no floods of moment in the tributary streams in the State of Ohio. Such as occurred were properly forecast and the damage was very small. The flood in the White River of Indiana and its forks was also moderate, the crest stages ranging from about 2 to 5 feet above the flood stage. Owing to the backwardness of the growing season the damage was small, probably not over \$10,000. However, the warnings allowed the removal of considerable property from bottom lands.

The flood in the Wabash River of Indiana and Illinois attained fair proportions on account of the rapid melting of the heavy snows that fell over northern Indiana on March 20-21. The flood was most marked at La Fayette, Ind., where the crest stage of 21.2 feet on March 31 was 10.2 feet above the flood stage. Warnings were issued as often as necessary, and there were no losses of livestock nor other portable property. Losses from other sources, flooding of basements, highways, etc., amounted to about \$4,000. The value of property saved through the warnings was about \$5,000.

Flood warnings for the lower Connecticut Valley were issued on April 7 after a 24-hour rainfall that was excessive over the lower valley, and at 9 p. m., April 8, the Connecticut River at Hartford, Conn., reached a stage of 20.7 feet, 4.7 feet above flood stage. There was no damage done along the main stream, but the smaller rivers were dangerously high, especially the Farmington and Park Rivers. It was impossible to obtain estimates as to the amount of damage done.

Warnings were again issued on April 15 for the lower valley and on April 18 and 19 for the entire valley after the heavy rains that began during the afternoon of April 18. The flood was a moderate one and the warnings were well verified. No damage was reported.

The heavy rains of April 6-7, together with some melted snow, also caused a marked flood in the Hudson River at Troy and Albany, N. Y., the river reaching 20.3 feet at Troy and 14.6 feet at Albany, 5.3 and 2.6 feet, respectively, above the flood stages. Warnings were issued promptly and the reported losses were small, only about \$7,400, while the saving through the warnings was perhaps \$2,500.

Flood conditions in the north branch of the Susquehanna River were very similar and were equally well forecast. The damage done, however, was somewhat greater, more than \$25,000, probably because a larger area was covered.

There were some minor floods in the rivers of the south Atlantic system and in the upper Coosa River of Georgia